

sequence listing-21416.ST25
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 Ala Gly Trp
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Phe Lys Asn Ser Tyr Asn Ser Val Ala Ser Glu Val Pro
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Tyr Leu Tyr Ser His Ala Asp Asp Ser Phe Phe Phe
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Pro His Thr Val Ser Glu Ile Asp Phe Asp Ser Ser Arg Ala Glu Ser
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Val Gln Thr Gln Arg Lys Pro Arg Pro Lys Gly His Val Ile Ala Cys
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Lys Ile Ile Arg Phe Leu Val Glu Ser Gly Asp His Ile Ser Ser Gly 690 695 700	
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Gln	Arg	His	Gly	Gln	Asp	Ser	Ala	Met	Pro	Asn	Val	Leu	Asn	Ile	
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tgg	gcc	aag	agt	gtt	gag	tcg	ctg	gta	atg	cag	atg	tct	gcc	gag	6309
Trp	Ala	Lys	Ser	Val	Glu	Ser	Leu	Val	Met	Gln	Met	Ser	Ala	Glu	
	1220					1225					1230				
atc	cag	aag	aag	gga	att	cga	cga	gtt	acc	ttc	ttg	gtt	tgc	cga	6354
Ile	Gln	Lys	Lys	Gly	Ile	Arg	Arg	Val	Thr	Phe	Leu	Val	Cys	Arg	
	1235					1240					1245				
aag	ggc	gtt	tac	ccc	tcc	tac	ttc	acc	ttc	aga	caa	gag	ggt	gcc	6399
Lys	Gly	Val	Tyr	Pro	Ser	Tyr	Phe	Thr	Phe	Arg	Gln	Glu	Gly	Ala	
	1250					1255					1260				
cag	ggc	ccc	tgg	aga	gag	gag	gag	aag	att	cga	aac	atc	gag	cct	6444
Gln	Gly	Pro	Trp	Arg	Glu	Glu	Glu	Lys	Ile	Arg	Asn	Ile	Glu	Pro	
	1265					1270					1275				
gct	cta	gcc	agt	cag	ctt	gag	ctc	aac	cga	ctc	tcg	aat	ttc	aag	6489
Ala	Leu	Ala	Ser	Gln	Leu	Glu	Leu	Asn	Arg	Leu	Ser	Asn	Phe	Lys	
	1280					1285					1290				
gtc	acc	cct	atc	ttc	gta	gac	aac	aga	cag	atc	cac	atc	tac	aag	6534
Val	Thr	Pro	Ile	Phe	Val	Asp	Asn	Arg	Gln	Ile	His	Ile	Tyr	Lys	
	1295					1300					1305				
gga	gtg	ggt	aag	gag	aac	tct	tcc	gat	gtt	cga	ttc	ttt	atc	cgg	6579
Gly	Val	Gly	Lys	Glu	Asn	Ser	Ser	Asp	Val	Arg	Phe	Phe	Ile	Arg	
	1310					1315					1320				
gct	ttg	gtt	cga	cct	gga	cgg	gtc	cag	gga	tcg	atg	aag	gct	gcc	6624
Ala	Leu	Val	Arg	Pro	Gly	Arg	Val	Gln	Gly	Ser	Met	Lys	Ala	Ala	
	1325					1330					1335				
gag	tat	ctc	atc	tcc	gag	tgc	gat	cga	ctg	ctc	act	gat	atc	ctg	6669
Glu	Tyr	Leu	Ile	Ser	Glu	Cys	Asp	Arg	Leu	Leu	Thr	Asp	Ile	Leu	
	1340					1345					1350				
gac	gcc	ttg	gag	gtt	gtt	gga	gcc	gag	act	cga	aac	gcc	gat	tgc	6714
Asp	Ala	Leu	Glu	Val	Val	Gly	Ala	Glu	Thr	Arg	Asn	Ala	Asp	Cys	
	1355					1360					1365				
aac	cat	gtt	gga	att	aac	ttc	atc	tat	aac	gtt	ctt	gtc	gac	ttc	6759
										13					

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Asn His Val Gly Ile Asn Phe Ile Tyr Asn Val Leu Val Asp Phe
 1370 1375 1380

gac gac gtc cag gag gcc ctt gcc ggg ttc att gag agg cac gga 6804
 Asp Asp Val Gln Glu Ala Leu Ala Gly Phe Ile Glu Arg His Gly
 1385 1390 1395

aag agg ctt tgg cga ctt cga gtg acc g gtaagtgttc tctcggcatt 6852
 Lys Arg Leu Trp Arg Leu Arg Val Thr
 1400 1405

gaattcagca atgagctgtg actaacgggt ttcttcggta tattag ct tct gaa 6906
 Ala Ser Glu
 1410

atc cga atg gtt ctt gag gac gac gag ggt aac gtc acc ccc atc 6951
 Ile Arg Met Val Leu Glu Asp Asp Glu Gly Asn Val Thr Pro Ile
 1415 1420 1425

cga tgc tgc att gag aac gtt tct g gtaagcagtc caaaataact 6996
 Arg Cys Cys Ile Glu Asn Val Ser
 1430

gataatccta ttcagtctag acattgtaac tgatgcattt ctcgttctta g gt ttc 7052
 Gly Phe
 1435

gtc gtg aag tac cac gcc tac cag gag gtt gag acc gag aag ggt 7097
 Val Val Lys Tyr His Ala Tyr Gln Glu Val Glu Thr Glu Lys Gly
 1440 1445 1450

act acc atc ttg aag tca atc gga gac ctt gga cct ctt cac ctt 7142
 Thr Thr Ile Leu Lys Ser Ile Gly Asp Leu Gly Pro Leu His Leu
 1455 1460 1465

cag cct gtc aac cat gct tac cag acc aag aac agt ctt cag ccc 7187
 Gln Pro Val Asn His Ala Tyr Gln Thr Lys Asn Ser Leu Gln Pro
 1470 1475 1480

cga cga tac cag gct cac ttg gtt gga acg act tac gtc t 7227
 Arg Arg Tyr Gln Ala His Leu Val Gly Thr Thr Tyr Val
 1485 1490

gttagtcaca tttcatgctc tggttttctg accgtcactg gttattgacg ttctgtttgg 7287

cgtcacag ac gac tac ccc gat ctc ttc gtt cag agt ttg cgc aag 7333
 Tyr Asp Tyr Pro Asp Leu Phe Val Gln Ser Leu Arg Lys
 1495 1500 1505

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 Val Trp Ala Glu Ala Ala Ala Lys Ile Pro His Leu Arg Val Pro
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agc gag cct ctt acc gct acc gag ttg gtt ctc gat gag aac aac 7423
 Ser Glu Pro Leu Thr Ala Thr Glu Leu Val Leu Asp Glu Asn Asn
 1525 1530 1535

gag ctt cag gag gtc gag cga cct ccg ggt tcc aac tcg tgt ggt 7468
 Glu Leu Gln Glu Val Glu Arg Pro Pro Gly Ser Asn Ser Cys Gly
 1540 1545 1550

atg gtc gcc tgg atc ttc act atg ctc act ccc gag tat ccc aag 7513
 Met Val Ala Trp Ile Phe Thr Met Leu Thr Pro Glu Tyr Pro Lys
 1555 1560 1565

ggt cga cga gta gtt gcc att gcc aac gat atc acc ttc aag att 7558
 Gly Arg Arg Val Val Ala Ile Ala Asn Asp Ile Thr Phe Lys Ile
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Gly Ser Phe Gly 1585 Pro Lys Glu Asp Asp 1590 Tyr Phe Phe Lys Ala 1595 Thr	
gaa att gcc aag aag ctg ggc ctt cct cga att tac ctc tct gcc	7648
Glu Ile Ala Lys 1600 Lys Leu Gly Leu Pro 1605 Arg Ile Tyr Leu Ser 1610 Ala	
aac agt gga gct aga ctc ggt atc gcg gag gag ctc ttg cac atc	7693
Asn Ser Gly Ala 1615 Arg Leu Gly Ile Ala 1620 Glu Glu Leu Leu His 1625 Ile	
ttc aag gcg gcc ttc gtt gac ccc gca aag cct tcc atg ggt att	7738
Phe Lys Ala Ala 1630 Phe Val Asp Pro Ala 1635 Lys Pro Ser Met Gly 1640 Ile	
aag tat cta tac ttg acc cct gaa act tta tcc act ctt gcc aag	7783
Lys Tyr Leu Tyr 1645 Leu Thr Pro Glu Thr 1650 Leu Ser Thr Leu Ala 1655 Lys	
aag gga tcc agc gtc acc act gag gag atc gag gat gac gcc gag	7828
Lys Gly Ser Ser 1660 Val Thr Thr Glu Glu 1665 Ile Glu Asp Asp Gly 1670 Glu	
cga cga cac aag atc acc gcc atc atc ggt ctt gca gag ggt ttg	7873
Arg Arg His Lys 1675 Ile Thr Ala Ile Ile 1680 Gly Leu Ala Glu Gly 1685 Leu	
gga gtt gag tct ctt cga gga tcc ggt ctt att gct gga gcc acc	7918
Gly Val Glu Ser 1690 Leu Arg Gly Ser Gly 1695 Leu Ile Ala Gly Ala 1700 Thr	
act cga gct tac gag gag gga atc ttc acc atc tct ctc gtt act	7963
Thr Arg Ala Tyr 1705 Glu Glu Gly Ile Phe 1710 Thr Ile Ser Leu Val 1715 Thr	
gcc cga tcg gtc ggt atc gga gct tac ttg gtt cga ttg ggt cag	8008
Ala Arg Ser Val 1720 Gly Ile Gly Ala Tyr 1725 Leu Val Arg Leu Gly 1730 Gln	
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Arg Ala Ile Gln 1735 Val Glu Gly Asn Pro 1740 Met Ile Leu Thr Gly 1745 Ala	
cag tct ctc aac aag gtg ctt gga cga gag gtt tac act tcc aac	8098
Gln Ser Leu Asn 1750 Lys Val Leu Gly Arg 1755 Glu Val Tyr Thr Ser 1760 Asn	
ctt cag ctt gga gga acc cag att atg gcc cga aac ggt acc acg	8143
Leu Gln Leu Gly 1765 Gly Thr Gln Ile Met Ala Arg Asn Gly Thr 1775 Thr	
cat ctc gtc gct gaa tct gat ctc gat ggt gct ctc aag gtc atc	8188
His Leu Val Ala 1780 Glu Ser Asp Leu Asp 1785 Gly Ala Leu Lys Val 1790 Ile	
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Gln Trp Leu Ser 1795 Tyr Val Pro Glu Arg 1800 Lys Gly Lys Ala Ile 1805 Pro	
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Ile Trp Pro Ser 1810 Glu Asp Pro Trp Asp 1815 Arg Thr Val Thr Tyr 1820 Glu	
cct ccc cga ggt cct tac gat cct cga tgg ttg ctt gaa gga aag	8323
Pro Pro Arg Gly 1825 Pro Tyr Asp Pro Arg 1830 Trp Leu Leu Glu Gly 1835 Lys	

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ccg	gat	gaa	ggc	ttg	act	ggt	ctt	ttc	gac	aag	gga	tct	ttc	atg	8368
Pro	Asp	Glu	Gly	Leu	Thr	Gly	Leu	Phe	Asp	Lys	Gly	Ser	Phe	Met	
			1840					1845					1850		
gag	acc	ctt	gga	gat	tgg	gcc	aag	act	atc	gtc	acc	ggt	cga	gcc	8413
Glu	Thr	Leu	Gly	Asp	Trp	Ala	Lys	Thr	Ile	Val	Thr	Gly	Arg	Ala	
			1855					1860					1865		
cga	ctg	gga	ggc	att	cct	atg	ggt	gtt	att	gct	gtc	gaa	acc	agg	8458
Arg	Leu	Gly	Gly	Ile	Pro	Met	Gly	Val	Ile	Ala	Val	Glu	Thr	Arg	
			1870					1875					1880		
acg	acc	gag	aag	atc	atc	gct	gcc	gat	cct	gcc	aac	cct	gca	gct	8503
Thr	Thr	Glu	Lys	Ile	Ile	Ala	Ala	Asp	Pro	Ala	Asn	Pro	Ala	Ala	
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Phe	Glu	Gln	Lys	Ile	Met	Glu	Ala	Gly	Gln	Val	Trp	Asn	Pro	Asn	
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Ala	Ala	Tyr	Lys	Thr	Ala	Gln	Ser	Ile	Phe	Asp	Ile	Asn	Lys	Glu	
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Gly	Leu	Pro	Leu	Met	Ile	Leu	Ala	Asn	Ile	Arg	Gly	Phe	Ser	Gly	
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gga	cag	ggt	gat	atg	ttt	gac	gct	atc	ctc	aag	cag	ggt	tct	aag	8683
Gly	Gln	Gly	Asp	Met	Phe	Asp	Ala	Ile	Leu	Lys	Gln	Gly	Ser	Lys	
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Ile	Val	Asp	Gly	Leu	Ser	Asn	Phe	Lys	Gln	Pro	Val	Phe	Val	Tyr	
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gtt	gtc	ccc	aac	gga	gag	ctt	cgt	gga	gga	gct	tgg	gtc	gtg	ttg	8773
Val	Val	Pro	Asn	Gly	Glu	Leu	Arg	Gly	Gly	Ala	Trp	Val	Val	Leu	
			1975					1980					1985		
gat	cct	act	atc	aac	ctt	gcc	aag	atg	gag	atg	tac	gct	gat	gaa	8818
Asp	Pro	Thr	Ile	Asn	Leu	Ala	Lys	Met	Glu	Met	Tyr	Ala	Asp	Glu	
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acc	gct	cga	gga	gga	att	ctc	gag	ccg	gaa	ggt	atc	gtt	gag	atc	8863
Thr	Ala	Arg	Gly	Gly	Ile	Leu	Glu	Pro	Glu	Gly	Ile	Val	Glu	Ile	
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Lys	Phe	Arg	Arg	Asp	Lys	Val	Ile	Ala	Thr	Met	Glu	Arg	Leu	Asp	
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gag	acc	tat	gcc	tct	ctc	aaa	gct	gcc	tcg	aac	gac	tca	acc	aag	8953
Glu	Thr	Tyr	Ala	Ser	Leu	Lys	Ala	Ala	Ser	Asn	Asp	Ser	Thr	Lys	
			2035					2040					2045		
tct	gcg	gag	gag	cga	gct	aag	agt	gct	gag	cta	ctc	aag	gca	aga	8998
Ser	Ala	Glu	Glu	Arg	Ala	Lys	Ser	Ala	Glu	Leu	Leu	Lys	Ala	Arg	
			2050					2055					2060		
gag	act	cta	ctt	caa	ccg	acg	tac	ttg	cag	att	gca	cac	ctt	tac	9043
Glu	Thr	Leu	Leu	Gln	Pro	Thr	Tyr	Leu	Gln	Ile	Ala	His	Leu	Tyr	
			2065					2070					2075		
gct	gat	ctc	cat	gat	cgt	gtc	gga	cga	atg	gag	gcc	aag	ggt	tgc	9088
Ala	Asp	Leu	His	Asp	Arg	Val	Gly	Arg	Met	Glu	Ala	Lys	Gly	Cys	
			2080					2085					2090		

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Ala Lys Arg Ala Val Trp Ala Glu Ala Arg Arg Phe Phe Tyr Trp
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2110 2115

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His Ile

ctg tct aag ttc gct gct gcc aac ccg gat ctt act ctc gag gag 9281
Leu Ser Lys Phe Ala Ala Ala Asn Pro Asp Leu Thr Leu Glu Glu
2120 2125 2130

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Arg Gln Asn Ile Leu Asp Ser Val Val Gln Thr Asp Leu Thr Asp
2135 2140 2145

gac cga gcc acc gct gaa tgg att gag cag tct gca gaa gag att 9371
Asp Arg Ala Thr Ala Glu Trp Ile Glu Gln Ser Ala Glu Glu Ile
2150 2155 2160

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Ala Ala Ala Val Ala Glu Val Arg Ser Thr Tyr Val Ser Asn Lys
2165 2170 2175

att atc agc ttc gcc gag acg gag cga gct gga gcg ttg cag ggc 9461
Ile Ile Ser Phe Ala Glu Thr Glu Arg Ala Gly Ala Leu Gln Gly
2180 2185 2190

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Leu Val Ala Val Leu Ser Thr Leu Asn Ala Glu Asp Lys Lys Ala
2195 2200 2205

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Leu Val Ser Ser Leu Gly Leu
2210

cctatcttta gtctttgatt aacttttgaa tatccttcat agatctttcc ttgcatacat 9620

tgatattatt tcctcaccg tttttatgta cttccatacg agtttccatt tttttctgct 9680

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Leu Glu Asn Ala Pro Pro Ser Ser Val Thr Asp Phe Val Arg Ser Gln	
20 25 30	
gat ggt cac acg gtc atc acc aaa gtc ctc att gcc aac aac gga atc	144
Asp Gly His Thr Val Ile Thr Lys Val Leu Ile Ala Asn Asn Gly Ile	
35 40 45	
gct gct gta aaa gag atc cga tca gtt cgt aaa tgg gct tac gag acg	192
Ala Ala Val Lys Glu Ile Arg Ser Val Arg Lys Trp Ala Tyr Glu Thr	
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ttt gga gat gag cga gcc atc gaa ttt acg gta atg gcc act cca gaa	240
Phe Gly Asp Glu Arg Ala Ile Glu Phe Thr Val Met Ala Thr Pro Glu	
65 70 75 80	
gat ttg aag gtg aac tgc gac tat att cga atg gct gat cga gtc gtc	288
Asp Leu Lys Val Asn Cys Asp Tyr Ile Arg Met Ala Asp Arg Val Val	
85 90 95	
gaa gtt cct gga gga act aac aac aac aat cac tct aac gtc gac ctc	336
Glu Val Pro Gly Gly Thr Asn Asn Asn Asn His Ser Asn Val Asp Leu	
100 105 110	
atc gtt gac att gcc gag cga ttc aat ata cat gct gtt tgg gct gga	384
Ile Val Asp Ile Ala Glu Arg Phe Asn Ile His Ala Val Trp Ala Gly	
115 120 125	
tgg ggt cac gct tcg gaa aac ccc aga ctt ccc gag tct ctc gcc gcc	432
Trp Gly His Ala Ser Glu Asn Pro Arg Leu Pro Glu Ser Leu Ala Ala	
130 135 140	
tca aag aac aag atc gtc ttc att ggt cct ccc gga tcc gct atg cga	480
Ser Lys Asn Lys Ile Val Phe Ile Gly Pro Pro Gly Ser Ala Met Arg	
145 150 155 160	

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gtg	ccg	tgt	atg	gcc	tgg	tct	gga	tca	ggc	atc	act	gat	aca	gag	ctc	576
Val	Pro	Cys	Met	Ala	Trp	Ser	Gly	Ser	Gly	Ile	Thr	Asp	Thr	Glu	Leu	
			180					185					190			
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Ser	Pro	Gln	Gly	Phe	Val	Thr	Val	Pro	Asp	Gly	Pro	Tyr	Gln	Ala	Ala	
		195					200					205				
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Cys	Val	Lys	Thr	Val	Glu	Asp	Gly	Leu	Val	Arg	Ala	Glu	Lys	Ile	Gly	
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Leu	Pro	Val	Met	Ile	Lys	Ala	Ser	Glu	Gly	Gly	Gly	Gly	Lys	Gly	Ile	
	225				230				235						240	
cga	atg	gtt	cac	agc	atg	gac	aca	ttc	aag	aac	tcc	tac	aac	tcc	gtc	768
Arg	Met	Val	His	Ser	Met	Asp	Thr	Phe	Lys	Asn	Ser	Tyr	Asn	Ser	Val	
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gct	tcc	gag	gtg	cca	gga	tct	ccg	att	ttc	atc	atg	gcc	ttg	gct	gga	816
Ala	Ser	Glu	Val	Pro	Gly	Ser	Pro	Ile	Phe	Ile	Met	Ala	Leu	Ala	Gly	
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tct	gct	cga	cat	ttg	gag	gtc	cag	ctc	ctt	gct	gat	cag	tac	gga	aac	864
Ser	Ala	Arg	His	Leu	Glu	Val	Gln	Leu	Leu	Ala	Asp	Gln	Tyr	Gly	Asn	
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gct	atc	tct	ttg	ttc	ggg	cga	gat	tgc	tct	gtt	cag	cga	cga	cat	cag	912
Ala	Ile	Ser	Leu	Phe	Gly	Arg	Asp	Cys	Ser	Val	Gln	Arg	Arg	His	Gln	
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Lys	Ile	Ile	Glu	Glu	Ala	Pro	Val	Thr	Ile	Ala	Arg	Pro	Glu	Arg	Phe	
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gaa	gag	atg	gag	aag	gct	gct	gtc	agg	ttg	gcc	aag	tta	gta	gga	tat	1008
Glu	Glu	Met	Glu	Lys	Ala	Ala	Val	Arg	Leu	Ala	Lys	Leu	Val	Gly	Tyr	
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gtt	agt	gcc	ggg	acc	gtc	gaa	tac	ctc	tac	tct	cac	gcc	gac	gac	tca	1056
Val	Ser	Ala	Gly	Thr	Val	Glu	Tyr	Leu	Tyr	Ser	His	Ala	Asp	Asp	Ser	
			340					345					350			
ttc	ttc	ttc	ctc	gaa	ctc	aac	cct	cga	ctt	caa	gtc	gag	cac	cct	act	1104
Phe	Phe	Phe	Leu	Glu	Leu	Asn	Pro	Arg	Leu	Gln	Val	Glu	His	Pro	Thr	
		355					360					365				
acc	gag	atg	gtc	tcg	ggg	gtc	aac	ctt	ccc	gct	gct	cag	ctt	cag	att	1152
Thr	Glu	Met	Val	Ser	Gly	Val	Asn	Leu	Pro	Ala	Ala	Gln	Leu	Gln	Ile	
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gct	atg	ggg	atc	cct	ctt	tct	cga	att	cgg	gat	att	cga	gtc	ctc	tac	1200
Ala	Met	Gly	Ile	Pro	Leu	Ser	Arg	Ile	Arg	Asp	Ile	Arg	Val	Leu	Tyr	
	385				390					395					400	
ggg	ctc	gat	ccc	cac	act	gtt	tcc	gag	atc	gac	ttc	gac	agc	agc	aga	1248
Gly	Leu	Asp	Pro	His	Thr	Val	Ser	Glu	Ile	Asp	Phe	Asp	Ser	Ser	Arg	
				405					410					415		
gcg	gag	tct	gtc	cag	act	cag	agg	aag	cct	agg	ccc	aag	ggg	cac	gtc	1296
Ala	Glu	Ser	Val	Gln	Thr	Gln	Arg	Lys	Pro	Arg	Pro	Lys	Gly	His	Val	
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att gcc tgt cga atc acg agt gaa aac ccc gat gag ggg ttc aag ccg Ile Ala Cys Arg Ile Thr Ser Glu Asn Pro Asp Glu Gly Phe Lys Pro 435 440 445	1344
tct gcc gga gat atc caa gag ttg aac ttc aga agt aat act aac gtc Ser Ala Gly Asp Ile Gln Glu Leu Asn Phe Arg Ser Asn Thr Asn Val 450 455 460	1392
tgg gga tac ttc tct gtt gga gct act gga gga att cat agt ttc gcc Trp Gly Tyr Phe Ser Val Gly Ala Thr Gly Gly Ile His Ser Phe Ala 465 470 475 480	1440
gat tct caa ttc ggt cac gtg ttt gct tat ggc tcc gac cga acg act Asp Ser Gln Phe Gly His Val Phe Ala Tyr Gly Ser Asp Arg Thr Thr 485 490 495	1488
gcc aga aag aat atg gtt atc gcc ttg aaa gag ctt tcc att cga gga Ala Arg Lys Asn Met Val Ile Ala Leu Lys Glu Leu Ser Ile Arg Gly 500 505 510	1536
gac ttc cga acc act gtc gag tat ctt atc act ctt ctt gag acg agc Asp Phe Arg Thr Thr Val Glu Tyr Leu Ile Thr Leu Glu Thr Ser 515 520 525	1584
gat ttc gag cag aac gcc att acc acc gct tgg ttg gat ggg ttg atc Asp Phe Glu Gln Asn Ala Ile Thr Thr Ala Trp Leu Asp Gly Leu Ile 530 535 540	1632
act aac aag ctt aca tct gag agg cct gat cca tca ctg gcc gtt att Thr Asn Lys Leu Thr Ser Glu Arg Pro Asp Pro Ser Leu Ala Val Ile 545 550 555 560	1680
tgt ggt gca att gtg aaa gct cac gtg gct tct gag aac tgt tgg gcc Cys Gly Ala Ile Val Lys Ala His Val Ala Ser Glu Asn Cys Trp Ala 565 570 575	1728
gaa tac cga cga gta ttg gac aag gga cag gtt ccc tcc aag gac act Glu Tyr Arg Arg Val Leu Asp Lys Gly Gln Val Pro Ser Lys Asp Thr 580 585 590	1776
ctc aag aca gtg ttc act ctt gat ttc atc tat gag ggt gtt cgg tac Leu Lys Thr Val Phe Thr Leu Asp Phe Ile Tyr Glu Gly Val Arg Tyr 595 600 605	1824
aat ttc acc gct gct cga gcc tcc ctc aac act tac cga ttg tat cta Asn Phe Thr Ala Ala Arg Ala Ser Leu Asn Thr Tyr Arg Leu Tyr Leu 610 615 620	1872
aac gga gga aag acc gtg gtg tcc atc cga cct ttg gcc gat ggt gga Asn Gly Gly Lys Thr Val Val Ser Ile Arg Pro Leu Ala Asp Gly Gly 625 630 635 640	1920
atg ctc gtt ctt ctc gat ggc cga tcc cac act ctc tac tgg agg gag Met Leu Val Leu Leu Asp Gly Arg Ser His Thr Leu Tyr Trp Arg Glu 645 650 655	1968
gaa gtc ggt acc ctc cga att cag gta gac gca aag act tgc ctg att Glu Val Gly Thr Leu Arg Ile Gln Val Asp Ala Lys Thr Cys Leu Ile 660 665 670	2016
gag cag gag aac gac ccc act cag ctc cga tca ccc tcg cct gga aag Glu Gln Glu Asn Asp Pro Thr Gln Leu Arg Ser Pro Ser Pro Gly Lys 675 680 685	2064
atc atc cgg ttt ttg gtc gaa agc gga gat cac atc tcc tcc gga gat Ile Ile Arg Phe Leu Val Glu Ser Gly Asp His Ile Ser Ser Gly Asp 690 695 700	2112

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atc Ile 705	tat Tyr	gct Ala	gag Glu	gtt Val	gag Glu 710	gtc Val	atg Met	aag Lys	atg Met	atc Ile 715	ttg Leu	ccc Pro	ttg Leu	att Ile	gcc Ala 720	2160
cag Gln	gag Glu	tcc Ser	ggt Gly	cac His 725	gtt Val	cag Gln	ttt Phe	gtc Val	aag Lys 730	caa Gln	gcc Ala	ggt Gly	gtg Val	acc Thr 735	gtc Val	2208
gat Asp	cct Pro	gga Gly	gcg Ala 740	att Ile	att Ile	ggg Gly	atc Ile	ttg Leu 745	agt Ser	ctt Leu	gat Asp	gac Asp	cct Pro 750	acg Thr	cga Arg	2256
gtg Val	aag Lys	aag Lys 755	gcg Ala	aag Lys	ccc Pro	ttc Phe	gag Glu 760	ggt Gly	ctc Leu	ctg Leu	cct Pro	gtg Val 765	act Thr	ggt Gly	ctc Leu	2304
cct Pro 770	aac Asn	ctg Leu	ccc Pro	ggt Gly	aac Asn	aga Arg 775	cct Pro	cac His	cag Gln	cgg Arg	cta Leu 780	cag Gln	ttc Phe	cag Gln	ctt Leu	2352
gag Glu 785	tcg Ser	ata Ile	tac Tyr	tcg Ser	gtc Val 790	ttg Leu	gat Asp	gga Gly	tac Tyr	gag Glu 795	agt Ser	gac Asp	tcc Ser	act Thr	gca Ala 800	2400
aca Thr	atc Ile	ctc Leu	cga Arg	tca Ser 805	ttc Phe	tct Ser	gaa Glu	aac Asn	ctt Leu 810	tat Tyr	gat Asp	cct Pro	gat Asp	ctt Leu 815	gct Ala	2448
ttc Phe	gga Gly	gag Glu	gct Ala 820	tta Leu	tcc Ser	atc Ile	att Ile	tcc Ser 825	gtc Val	ctt Leu	tct Ser	ggg Gly	aga Arg 830	atg Met	cct Pro	2496
gcc Ala	gat Asp	ctt Leu 835	gag Glu	gag Glu	agc Ser	att Ile	cga Arg 840	gag Glu	gtc Val	atc Ile	agc Ser	gaa Glu 845	gct Ala	cag Gln	tcg Ser	2544
aag Lys 850	cct Pro	cac His	gcc Ala	gag Glu	ttc Phe	cct Pro 855	gga Gly	tca Ser	aag Lys	atc Ile	ctc Leu 860	aaa Lys	gtc Val	gtc Val	gag Glu	2592
cgg Arg 865	tac Tyr	atc Ile	gat Asp	aat Asn	ttg Leu 870	cga Arg	cct Pro	cag Gln	gag Glu	agg Arg 875	gct Ala	atg Met	gtc Val	cga Arg	act Thr 880	2640
cag Gln	atc Ile	gaa Glu	ccc Pro	atc Ile 885	gtt Val	ggt Gly	att Ile	gct Ala	gag Glu 890	aag Lys	aac Asn	gtt Val	ggc Gly	ggt Gly 895	cct Pro	2688
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gcc Ala	gtt Val	gag Glu 915	gcc Ala	gtt Val	ttt Phe	gct Ala	act Thr 920	ggt Gly	agt Ser	gaa Glu	gag Glu	gcc Ala 925	att Ile	gtt Val	ctc Leu	2784
caa Gln 930	ctt Leu	cga Arg	gat Asp	gaa Glu	aac Asn	cga Arg 935	gaa Glu	tct Ser	ttg Leu	aac Asn	gac Asp 940	gtc Val	ctt Leu	ggt Gly	ctc Leu	2832
gtc Val 945	ctg Leu	gct Ala	cac His	tcg Ser	cgt Arg 950	ctc Leu	agc Ser	gct Ala	cga Arg	tcc Ser 955	aag Lys	ctt Leu	gtt Val	ctc Leu	tcc Ser 960	2880
gtc Val	ttt Phe	gat Asp	ctg Leu	atc Ile 965	aag Lys	tct Ser	atg Met	cag Gln	ctc Leu 970	ctc Leu	aac Asn	aac Asn	act Thr	gag Glu 975	ggt Gly	2928

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tct tgc tct ctt ccc tct tac gag gag agg ttg ttc cag atg gaa Ser Cys Ser Leu Pro Ser Tyr Glu Glu Arg Leu Phe Gln Met Glu 1010 1015 1020	3069
aag atc ctt aac tct tct gtc acc act tct tac tac gga gag act Lys Ile Leu Asn Ser Ser Val Thr Thr Ser Tyr Tyr Gly Glu Thr 1025 1030 1035	3114
gga ggt gga cac aga aac cct tcg gtt gat gtt ctg act gag atc Gly Gly Gly His Arg Asn Pro Ser Val Asp Val Leu Thr Glu Ile 1040 1045 1050	3159
tca aac tct cga ttc acc gtc tac gat gtc ctg tcc tcc ttc ttc Ser Asn Ser Arg Phe Thr Val Tyr Asp Val Leu Ser Ser Phe Phe 1055 1060 1065	3204
aag cac gat gat cct tgg att gtt ctt gct agt ttg acc gtc tac Lys His Asp Asp Pro Trp Ile Val Leu Ala Ser Leu Thr Val Tyr 1070 1075 1080	3249
gtt ctt cga gct tac cga gag tac agt att ctt gat atg caa cat Val Leu Arg Ala Tyr Arg Glu Tyr Ser Ile Leu Asp Met Gln His 1085 1090 1095	3294
gag caa ggt cag gat ggc gct gct gga gtc atc act tgg cga ttc Glu Gln Gly Gln Asp Gly Ala Ala Gly Val Ile Thr Trp Arg Phe 1100 1105 1110	3339
aag ctc aac cag ccc atc gct gag tct tct act ccc cga gtt gac Lys Leu Asn Gln Pro Ile Ala Glu Ser Ser Thr Pro Arg Val Asp 1115 1120 1125	3384
tcg aat cga gac gtt tac cga gtc ggt tcg ctt tct gat ttg acc Ser Asn Arg Asp Val Tyr Arg Val Gly Ser Leu Ser Asp Leu Thr 1130 1135 1140	3429
tac aag atc aag cag agt cag acc gag ccc ctc cga gct ggt gtc Tyr Lys Ile Lys Gln Ser Gln Thr Glu Pro Leu Arg Ala Gly Val 1145 1150 1155	3474
atg acg agc ttc aac aac ttg aag gag gtt cag gac gga ctc ttg Met Thr Ser Phe Asn Asn Leu Lys Glu Val Gln Asp Gly Leu Leu 1160 1165 1170	3519
aat gtt ctg tct ttc ttc cct gct tac cat cat caa gat ttc act Asn Val Leu Ser Phe Phe Pro Ala Tyr His His Gln Asp Phe Thr 1175 1180 1185	3564
caa cga cat ggt cag gac agt gcc atg ccc aac gtt ctc aac att Gln Arg His Gly Gln Asp Ser Ala Met Pro Asn Val Leu Asn Ile 1190 1195 1200	3609
gct atc cgg gct ttc gag gag aag gac gac atg tct gat ctt gat Ala Ile Arg Ala Phe Glu Glu Lys Asp Asp Met Ser Asp Leu Asp 1205 1210 1215	3654
tgg gcc aag agt gtt gag tcg ctg gta atg cag atg tct gcc gag Trp Ala Lys Ser Val Glu Ser Leu Val Met Gln Met Ser Ala Glu 1220 1225 1230	3699

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aag Lys	ggc Gly 1250	gtt Val	tac Tyr	ccc Pro	tcc Ser	tac Tyr 1255	ttc Phe	acc Thr	ttc Phe	aga Arg	caa Gln 1260	gag Glu	ggt Gly	gcc Ala	3789
cag Gln 1265	ggc Gly	ccc Pro	tgg Trp	aga Arg	gag Glu	gag Glu 1270	gag Glu	aag Lys	att Ile	cga Arg	aac Asn 1275	atc Ile	gag Glu	cct Pro	3834
gct Ala 1280	cta Leu	gcc Ala	agt Ser	cag Gln	ctt Leu	gag Glu 1285	ctc Leu	aac Asn	cga Arg	ctc Leu	tcg Ser 1290	aat Asn	ttc Phe	aag Lys	3879
gtc Val 1295	acc Thr	cct Pro	atc Ile	ttc Phe	gta Val	gac Asp 1300	aac Asn	aga Arg	cag Gln	atc Ile	cac His 1305	atc Ile	tac Tyr	aag Lys	3924
gga Gly 1310	gtg Val	ggt Gly	aag Lys	gag Glu	aac Asn	tct Ser 1315	tcc Ser	gat Asp	gtt Val	cga Arg	ttc Phe 1320	ttt Phe	atc Ile	cgg Arg	3969
gct Ala 1325	ttg Leu	gtt Val	cga Arg	cct Pro	gga Gly	cgg Arg 1330	gtc Val	cag Gln	gga Gly	tcg Ser	atg Met 1335	aag Lys	gct Ala	gcc Ala	4014
gag Glu 1340	tat Tyr	ctc Leu	atc Ile	tcc Ser	gag Glu	tgc Cys 1345	gat Asp	cga Arg	ctg Leu	ctc Leu	act Thr 1350	gat Asp	atc Ile	ctg Leu	4059
gac Asp 1355	gcc Ala	ttg Leu	gag Glu	gtt Val	gtt Val	gga Gly 1360	gcc Ala	gag Glu	act Thr	cga Arg	aac Asn 1365	gcc Ala	gat Asp	tgc Cys	4104
aac Asn 1370	cat His	gtt Val	gga Gly	att Ile	aac Asn	ttc Phe 1375	atc Ile	tat Tyr	aac Asn	gtt Val	ctt Leu 1380	gtc Val	gac Asp	ttc Phe	4149
gac Asp 1385	gac Asp	gtc Val	cag Gln	gag Glu	gcc Ala	ctt Leu 1390	gcc Ala	ggg Gly	ttc Phe	att Ile	gag Glu 1395	agg Arg	cac His	gga Gly	4194
aag Lys 1400	agg Arg	ctt Leu	tgg Trp	cga Arg	ctt Leu	cga Arg 1405	gtg Val	acc Thr	gct Ala	tct Ser	gaa Glu 1410	atc Ile	cga Arg	atg Met	4239
gtt Val 1415	ctt Leu	gag Glu	gac Asp	gac Asp	gag Glu	ggt Gly 1420	aac Asn	gtc Val	acc Thr	ccc Pro	atc Ile 1425	cga Arg	tgc Cys	tgc Cys	4284
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gac Asp 1460	ctt Leu	gga Gly	cct Pro	ctt Leu	cac His	ctt Leu 1465	cag Gln	cct Pro	gtc Val	aac Asn	cat His 1470	gct Ala	tac Tyr	cag Gln	4419
acc Thr 1475	aag Lys	aac Asn	agt Ser	ctt Leu	cag Gln	ccc Pro 1480	cga Arg	cga Arg	tac Tyr	cag Gln	gct Ala 1485	cac His	ttg Leu	gtt Val	4464

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ttg Leu	cgc Arg 1505	aag Lys	gtt Val	tgg Trp	gct Ala	gag Glu 1510	gct Ala	gct Ala	gct Ala	aag Lys	att Ile 1515	cct Pro	cac His	ctc Leu	4554
cgg Arg	gtg Val 1520	cct Pro	agc Ser	gag Glu	cct Pro	ctt Leu 1525	acc Thr	gct Ala	acc Thr	gag Glu	ttg Leu 1530	ggt Val	ctc Leu	gat Asp	4599
gag Glu	aac Asn 1535	aac Asn	gag Glu	ctt Leu	cag Gln	gag Glu 1540	gtc Val	gag Glu	cga Arg	cct Pro	ccg Pro 1545	ggt Gly	tcc Ser	aac Asn	4644
tcg Ser	tgt Cys 1550	ggt Gly	atg Met	gtc Val	gcc Ala	tgg Trp 1555	atc Ile	ttc Phe	act Thr	atg Met	ctc Leu 1560	act Thr	ccc Pro	gag Glu	4689
tat Tyr	ccc Pro 1565	aag Lys	ggt Gly	cga Arg	cga Arg	gta Val 1570	gtt Val	gcc Ala	att Ile	gcc Ala	aac Asn 1575	gat Asp	atc Ile	acc Thr	4734
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atg Met	ggt Gly 1640	att Ile	aag Lys	tat Tyr	cta Leu	tac Tyr 1645	ttg Leu	acc Thr	cct Pro	gaa Glu	act Thr 1650	tta Leu	tcc Ser	act Thr	4959
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ctc Leu	gtt Val 1715	act Thr	gcc Ala	cga Arg	tcg Ser	gtc Val 1720	ggt Gly	atc Ile	gga Gly	gct Ala	tac Tyr 1725	ttg Leu	gtt Val	cga Arg	5184
ttg Leu	ggt Gly 1730	cag Gln	cga Arg	gct Ala	att Ile	cag Gln 1735	gtt Val	gaa Glu	ggc Gly	aac Asn	cct Pro 1740	atg Met	atc Ile	ctt Leu	5229

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aag Lys	gtc Val 1790	atc Ile	cag Gln	tgg Trp	ctc Leu	tcg Ser 1795	tat Tyr	gtg Val	ccc Pro	gag Glu	cga Arg 1800	aag Lys	ggc Gly	aag Lys	5409
gcc Ala	att Ile 1805	cct Pro	atc Ile	tgg Trp	cct Pro	tcc Ser 1810	gag Glu	gac Asp	cct Pro	tgg Trp	gac Asp 1815	cga Arg	act Thr	gtg Val	5454
acc Thr	tac Tyr 1820	gag Glu	cct Pro	ccc Pro	cga Arg	ggt Gly 1825	cct Pro	tac Tyr	gat Asp	cct Pro	cga Arg 1830	tgg Trp	ttg Leu	ctt Leu	5499
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ggt Gly	cga Arg 1865	gcc Ala	cga Arg	ctg Leu	gga Gly	ggc Gly 1870	att Ile	cct Pro	atg Met	ggt Gly	gtt Val 1875	att Ile	gct Ala	gtc Val	5634
gaa Glu	acc Thr 1880	agg Arg	acg Thr	acc Thr	gag Glu	aag Lys 1885	atc Ile	atc Ile	gct Ala	gcc Ala	gat Asp 1890	cct Pro	gcc Ala	aac Asn	5679
cct Pro	gca Ala 1895	gct Ala	ttc Phe	gag Glu	caa Gln	aag Lys 1900	att Ile	atg Met	gag Glu	gct Ala	ggt Gly 1905	cag Gln	gtt Val	tgg Trp	5724
aac Asn	ccc Pro 1910	aac Asn	gct Ala	gct Ala	tac Tyr	aag Lys 1915	acc Thr	gct Ala	caa Gln	tcc Ser	atc Ile 1920	ttt Phe	gat Asp	atc Ile	5769
aac Asn	aag Lys 1925	gag Glu	ggt Gly	ctt Leu	cct Pro	ttg Leu 1930	atg Met	atc Ile	ctt Leu	gcc Ala	aac Asn 1935	atc Ile	cga Arg	ggt Gly	5814
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ggt Gly	tct Ser 1955	aag Lys	atc Ile	gtt Val	gac Asp	ggt Gly 1960	ctc Leu	tcg Ser	aac Asn	ttc Phe	aag Lys 1965	cag Gln	cca Pro	gtg Val	5904
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2015 2020 2025	
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2030 2035 2040	
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2045 2050 2055	
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2060 2065 2070	
cac ctt tac gct gat ctc cat gat cgt gtc gga cga atg gag gcc His Leu Tyr Ala Asp Leu His Asp Arg Val Gly Arg Met Glu Ala	6264
2075 2080 2085	
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2090 2095 2100	
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2105 2110 2115	
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2120 2125 2130	
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2135 2140 2145	
cga gcc acc gct gaa tgg att gag cag tct gca gaa gag att gct Arg Ala Thr Ala Glu Trp Ile Glu Gln Ser Ala Glu Glu Ile Ala	6489
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<212> PRT

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<213> Phaffia rhodozyma

<400> 3

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Leu Glu Asn Ala Pro Pro Ser Ser Val Thr Asp Phe Val Arg Ser Gln
 20 25 30

Asp Gly His Thr Val Ile Thr Lys Val Leu Ile Ala Asn Asn Gly Ile
 35 40 45

Ala Ala Val Lys Glu Ile Arg Ser Val Arg Lys Trp Ala Tyr Glu Thr
 50 55 60

Phe Gly Asp Glu Arg Ala Ile Glu Phe Thr Val Met Ala Thr Pro Glu
 65 70 75 80

Asp Leu Lys Val Asn Cys Asp Tyr Ile Arg Met Ala Asp Arg Val Val
 85 90 95

Glu Val Pro Gly Gly Thr Asn Asn Asn Asn His Ser Asn Val Asp Leu
 100 105 110

Ile Val Asp Ile Ala Glu Arg Phe Asn Ile His Ala Val Trp Ala Gly
 115 120 125

Trp Gly His Ala Ser Glu Asn Pro Arg Leu Pro Glu Ser Leu Ala Ala
 130 135 140

Ser Lys Asn Lys Ile Val Phe Ile Gly Pro Pro Gly Ser Ala Met Arg
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Ser Leu Gly Asp Lys Ile Ser Ser Thr Ile Val Ala Gln Ser Ala Gln
 165 170 175

Val Pro Cys Met Ala Trp Ser Gly Ser Gly Ile Thr Asp Thr Glu Leu
 180 185 190

Ser Pro Gln Gly Phe Val Thr Val Pro Asp Gly Pro Tyr Gln Ala Ala
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Cys Val Lys Thr Val Glu Asp Gly Leu Val Arg Ala Glu Lys Ile Gly
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Leu Pro Val Met Ile Lys Ala Ser Glu Gly Gly Gly Lys Gly Ile
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Arg Met Val His Ser Met Asp Thr Phe Lys Asn Ser Tyr Asn Ser Val
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Ala Ser Glu Val Pro Gly Ser Pro Ile Phe Ile Met Ala Leu Ala Gly
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 Ser Ala Arg His Leu Glu Val Gln Leu Leu Ala Asp Gln Tyr Gly Asn
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 Ala Ile Ser Leu Phe Gly Arg Asp Cys Ser Val Gln Arg Arg His Gln
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 Lys Ile Ile Glu Glu Ala Pro Val Thr Ile Ala Arg Pro Glu Arg Phe
 305 310 315 320
 Glu Glu Met Glu Lys Ala Ala Val Arg Leu Ala Lys Leu Val Gly Tyr
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 Phe Phe Phe Leu Glu Leu Asn Pro Arg Leu Gln Val Glu His Pro Thr
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 Thr Glu Met Val Ser Gly Val Asn Leu Pro Ala Ala Gln Leu Gln Ile
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 Ala Met Gly Ile Pro Leu Ser Arg Ile Arg Asp Ile Arg Val Leu Tyr
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 Gly Leu Asp Pro His Thr Val Ser Glu Ile Asp Phe Asp Ser Ser Arg
 405 410 415
 Ala Glu Ser Val Gln Thr Gln Arg Lys Pro Arg Pro Lys Gly His Val
 420 425 430
 Ile Ala Cys Arg Ile Thr Ser Glu Asn Pro Asp Glu Gly Phe Lys Pro
 435 440 445
 Ser Ala Gly Asp Ile Gln Glu Leu Asn Phe Arg Ser Asn Thr Asn Val
 450 455 460
 Trp Gly Tyr Phe Ser Val Gly Ala Thr Gly Gly Ile His Ser Phe Ala
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 Asp Ser Gln Phe Gly His Val Phe Ala Tyr Gly Ser Asp Arg Thr Thr
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 Ala Arg Lys Asn Met Val Ile Ala Leu Lys Glu Leu Ser Ile Arg Gly
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 Asp Phe Arg Thr Thr Val Glu Tyr Leu Ile Thr Leu Leu Glu Thr Ser
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Asp Phe Glu Gln Asn Ala Ile Thr Thr Ala Trp Leu Asp Gly Leu Ile
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 Cys Gly Ala Ile Val Lys Ala His Val Ala Ser Glu Asn Cys Trp Ala
 565 570 575
 Glu Tyr Arg Arg Val Leu Asp Lys Gly Gln Val Pro Ser Lys Asp Thr
 580 585 590
 Leu Lys Thr Val Phe Thr Leu Asp Phe Ile Tyr Glu Gly Val Arg Tyr
 595 600 605
 Asn Phe Thr Ala Ala Arg Ala Ser Leu Asn Thr Tyr Arg Leu Tyr Leu
 610 615 620
 Asn Gly Gly Lys Thr Val Val Ser Ile Arg Pro Leu Ala Asp Gly Gly
 625 630 635 640
 Met Leu Val Leu Leu Asp Gly Arg Ser His Thr Leu Tyr Trp Arg Glu
 645 650 655
 Glu Val Gly Thr Leu Arg Ile Gln Val Asp Ala Lys Thr Cys Leu Ile
 660 665 670
 Glu Gln Glu Asn Asp Pro Thr Gln Leu Arg Ser Pro Ser Pro Gly Lys
 675 680 685
 Ile Ile Arg Phe Leu Val Glu Ser Gly Asp His Ile Ser Ser Gly Asp
 690 695 700
 Ile Tyr Ala Glu Val Glu Val Met Lys Met Ile Leu Pro Leu Ile Ala
 705 710 715 720
 Gln Glu Ser Gly His Val Gln Phe Val Lys Gln Ala Gly Val Thr Val
 725 730 735
 Asp Pro Gly Ala Ile Ile Gly Ile Leu Ser Leu Asp Asp Pro Thr Arg
 740 745 750
 Val Lys Lys Ala Lys Pro Phe Glu Gly Leu Leu Pro Val Thr Gly Leu
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 Pro Asn Leu Pro Gly Asn Arg Pro His Gln Arg Leu Gln Phe Gln Leu
 770 775 780
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 785 790 795 800

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Thr Ile Leu Arg Ser Phe Ser Glu Asn Leu Tyr Asp Pro Asp Leu Ala
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 Phe Gly Glu Ala Leu Ser Ile Ile Ser Val Leu Ser Gly Arg Met Pro
 820 825 830
 Ala Asp Leu Glu Glu Ser Ile Arg Glu Val Ile Ser Glu Ala Gln Ser
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 Lys Pro His Ala Glu Phe Pro Gly Ser Lys Ile Leu Lys Val Val Glu
 850 855 860
 Arg Tyr Ile Asp Asn Leu Arg Pro Gln Glu Arg Ala Met Val Arg Thr
 865 870 875 880
 Gln Ile Glu Pro Ile Val Gly Ile Ala Glu Lys Asn Val Gly Gly Pro
 885 890 895
 Lys Gly Tyr Ala Ser Tyr Val Leu Ala Thr Ile Leu Gln Lys Phe Leu
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 Ala Val Glu Ala Val Phe Ala Thr Gly Ser Glu Glu Ala Ile Val Leu
 915 920 925
 Gln Leu Arg Asp Glu Asn Arg Glu Ser Leu Asn Asp Val Leu Gly Leu
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 Val Leu Ala His Ser Arg Leu Ser Ala Arg Ser Lys Leu Val Leu Ser
 945 950 955 960
 Val Phe Asp Leu Ile Lys Ser Met Gln Leu Leu Asn Asn Thr Glu Gly
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 Ser Phe Leu His Lys Thr Met Lys Ala Leu Ala Asp Met Pro Thr Lys
 980 985 990
 Ala Pro Leu Ala Ser Lys Val Ser Leu Lys Ala Arg Glu Ile Leu Ile
 995 1000 1005
 Ser Cys Ser Leu Pro Ser Tyr Glu Glu Arg Leu Phe Gln Met Glu
 1010 1015 1020
 Lys Ile Leu Asn Ser Ser Val Thr Thr Ser Tyr Tyr Gly Glu Thr
 1025 1030 1035
 Gly Gly Gly His Arg Asn Pro Ser Val Asp Val Leu Thr Glu Ile
 1040 1045 1050
 Ser Asn Ser Arg Phe Thr Val Tyr Asp Val Leu Ser Ser Phe Phe
 1055 1060 1065

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Lys His Asp Asp Pro Trp Ile Val Leu Ala Ser Leu Thr Val Tyr
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 Val Leu Arg Ala Tyr Arg Glu Tyr Ser Ile Leu Asp Met Gln His
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 Glu Gln Gly Gln Asp Gly Ala Ala Gly Val Ile Thr Trp Arg Phe
 1100 1105 1110
 Lys Leu Asn Gln Pro Ile Ala Glu Ser Ser Thr Pro Arg Val Asp
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 Ser Asn Arg Asp Val Tyr Arg Val Gly Ser Leu Ser Asp Leu Thr
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 Gln Arg His Gly Gln Asp Ser Ala Met Pro Asn Val Leu Asn Ile
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 Trp Ala Lys Ser Val Glu Ser Leu Val Met Gln Met Ser Ala Glu
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 Ile Gln Lys Lys Gly Ile Arg Arg Val Thr Phe Leu Val Cys Arg
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 Lys Gly Val Tyr Pro Ser Tyr Phe Thr Phe Arg Gln Glu Gly Ala
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 Gln Gly Pro Trp Arg Glu Glu Glu Lys Ile Arg Asn Ile Glu Pro
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 Ala Leu Ala Ser Gln Leu Glu Leu Asn Arg Leu Ser Asn Phe Lys
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 Val Thr Pro Ile Phe Val Asp Asn Arg Gln Ile His Ile Tyr Lys
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 Asn His Val Gly Ile Asn Phe Ile Tyr Asn Val Leu Val Asp Phe
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 Asp Asp Val Gln Glu Ala Leu Ala Gly Phe Ile Glu Arg His Gly
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 Lys Arg Leu Trp Arg Leu Arg Val Thr Ala Ser Glu Ile Arg Met
 1400 1405 1410
 Val Leu Glu Asp Asp Glu Gly Asn Val Thr Pro Ile Arg Cys Cys
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 Ile Glu Asn Val Ser Gly Phe Val Val Lys Tyr His Ala Tyr Gln
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 Glu Val Glu Thr Glu Lys Gly Thr Thr Ile Leu Lys Ser Ile Gly
 1445 1450 1455
 Asp Leu Gly Pro Leu His Leu Gln Pro Val Asn His Ala Tyr Gln
 1460 1465 1470
 Thr Lys Asn Ser Leu Gln Pro Arg Arg Tyr Gln Ala His Leu Val
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 Gly Thr Thr Tyr Val Tyr Asp Tyr Pro Asp Leu Phe Val Gln Ser
 1490 1495 1500
 Leu Arg Lys Val Trp Ala Glu Ala Ala Ala Lys Ile Pro His Leu
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 Arg Val Pro Ser Glu Pro Leu Thr Ala Thr Glu Leu Val Leu Asp
 1520 1525 1530
 Glu Asn Asn Glu Leu Gln Glu Val Glu Arg Pro Pro Gly Ser Asn
 1535 1540 1545
 Ser Cys Gly Met Val Ala Trp Ile Phe Thr Met Leu Thr Pro Glu
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 Tyr Pro Lys Gly Arg Arg Val Val Ala Ile Ala Asn Asp Ile Thr
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Phe Lys Ile Gly Ser Phe Gly Pro Lys Glu Asp Asp Tyr Phe Phe
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 Lys Ala Thr Glu Ile Ala Lys Lys Leu Gly Leu Pro Arg Ile Tyr
 1595 1600 1605
 Leu Ser Ala Asn Ser Gly Ala Arg Leu Gly Ile Ala Glu Glu Leu
 1610 1615 1620
 Leu His Ile Phe Lys Ala Ala Phe Val Asp Pro Ala Lys Pro Ser
 1625 1630 1635
 Met Gly Ile Lys Tyr Leu Tyr Leu Thr Pro Glu Thr Leu Ser Thr
 1640 1645 1650
 Leu Ala Lys Lys Gly Ser Ser Val Thr Thr Glu Glu Ile Glu Asp
 1655 1660 1665
 Asp Gly Glu Arg Arg His Lys Ile Thr Ala Ile Ile Gly Leu Ala
 1670 1675 1680
 Glu Gly Leu Gly Val Glu Ser Leu Arg Gly Ser Gly Leu Ile Ala
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 Gly Ala Thr Thr Arg Ala Tyr Glu Glu Gly Ile Phe Thr Ile Ser
 1700 1705 1710
 Leu Val Thr Ala Arg Ser Val Gly Ile Gly Ala Tyr Leu Val Arg
 1715 1720 1725
 Leu Gly Gln Arg Ala Ile Gln Val Glu Gly Asn Pro Met Ile Leu
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 Thr Gly Ala Gln Ser Leu Asn Lys Val Leu Gly Arg Glu Val Tyr
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 Thr Ser Asn Leu Gln Leu Gly Gly Thr Gln Ile Met Ala Arg Asn
 1760 1765 1770
 Gly Thr Thr His Leu Val Ala Glu Ser Asp Leu Asp Gly Ala Leu
 1775 1780 1785
 Lys Val Ile Gln Trp Leu Ser Tyr Val Pro Glu Arg Lys Gly Lys
 1790 1795 1800
 Ala Ile Pro Ile Trp Pro Ser Glu Asp Pro Trp Asp Arg Thr Val
 1805 1810 1815
 Thr Tyr Glu Pro Pro Arg Gly Pro Tyr Asp Pro Arg Trp Leu Leu
 1820 1825 1830

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Glu Gly Lys Pro Asp Glu Gly Leu Thr Gly Leu Phe Asp Lys Gly
 1835 1840 1845
 Ser Phe Met Glu Thr Leu Gly Asp Trp Ala Lys Thr Ile Val Thr
 1850 1855 1860
 Gly Arg Ala Arg Leu Gly Gly Ile Pro Met Gly Val Ile Ala Val
 1865 1870 1875
 Glu Thr Arg Thr Thr Glu Lys Ile Ile Ala Ala Asp Pro Ala Asn
 1880 1885 1890
 Pro Ala Ala Phe Glu Gln Lys Ile Met Glu Ala Gly Gln Val Trp
 1895 1900 1905
 Asn Pro Asn Ala Ala Tyr Lys Thr Ala Gln Ser Ile Phe Asp Ile
 1910 1915 1920
 Asn Lys Glu Gly Leu Pro Leu Met Ile Leu Ala Asn Ile Arg Gly
 1925 1930 1935
 Phe Ser Gly Gly Gln Gly Asp Met Phe Asp Ala Ile Leu Lys Gln
 1940 1945 1950
 Gly Ser Lys Ile Val Asp Gly Leu Ser Asn Phe Lys Gln Pro Val
 1955 1960 1965
 Phe Val Tyr Val Val Pro Asn Gly Glu Leu Arg Gly Gly Ala Trp
 1970 1975 1980
 Val Val Leu Asp Pro Thr Ile Asn Leu Ala Lys Met Glu Met Tyr
 1985 1990 1995
 Ala Asp Glu Thr Ala Arg Gly Gly Ile Leu Glu Pro Glu Gly Ile
 2000 2005 2010
 Val Glu Ile Lys Phe Arg Arg Asp Lys Val Ile Ala Thr Met Glu
 2015 2020 2025
 Arg Leu Asp Glu Thr Tyr Ala Ser Leu Lys Ala Ala Ser Asn Asp
 2030 2035 2040
 Ser Thr Lys Ser Ala Glu Glu Arg Ala Lys Ser Ala Glu Leu Leu
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 Lys Ala Arg Glu Thr Leu Leu Gln Pro Thr Tyr Leu Gln Ile Ala
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 His Leu Tyr Ala Asp Leu His Asp Arg Val Gly Arg Met Glu Ala
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Lys Gly Cys Ala Lys Arg Ala Val Trp Ala Glu Ala Arg Arg Phe
 2090 2095 2100
 Phe Tyr Trp Arg Leu Arg Arg Arg Leu Asn Asp Glu His Ile Leu
 2105 2110 2115
 Ser Lys Phe Ala Ala Ala Asn Pro Asp Leu Thr Leu Glu Glu Arg
 2120 2125 2130
 Gln Asn Ile Leu Asp Ser Val Val Gln Thr Asp Leu Thr Asp Asp
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 Arg Ala Thr Ala Glu Trp Ile Glu Gln Ser Ala Glu Glu Ile Ala
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 Ala Ala Val Ala Glu Val Arg Ser Thr Tyr Val Ser Asn Lys Ile
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 Ile Ser Phe Ala Glu Thr Glu Arg Ala Gly Ala Leu Gln Gly Leu
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